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U.S. Army Corps of Engineers Military Construction Management Costs

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Jordan W. Cassell
Jeffrey A. Hawkins

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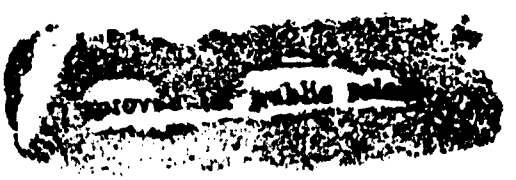
Logistics Management Institute
2000 Corporate Ridge
McLean, Virginia 22102-7805



U.S. Army Corps of Engineers Military Construction Management Costs

Executive Summary

The U.S. Army Corps of Engineers (USACE) is the largest public engineering, design, and construction management agency in the world. Its Federal customers include the Office of the Secretary of Defense, the Military Departments, and Federal agencies. The construction management services that USACE provides are paid for through fees assessed against the placement value of the construction.

Some customers believe that the fees charged by USACE are too high. We find that this is not the case. Most USACE customers simply are not aware of all the services they receive from the Corps. USACE is a full-service construction management organization. The fees it charges compare favorably with what private-sector construction management firms charge for equivalent services.

We recommend that USACE's Chief of Construction communicate our findings to USACE customers by publishing and distributing to them a brochure explaining USACE services and fees.

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Introduction and Background

The U.S. Army Corps of Engineers (USACE) provides construction management services for more than $3 billion of construction each year. Those management services, generally referred to as supervision and administration (S&A), are provided to the Military Departments, Defense agencies, and other Federal agencies. Most USACE customers pay for services through construction management fees applied to the cost of the constructed project. This fee is referred to as the S&A rate. The remaining customers pay on a cost-reimbursement basis.

Some USACE customers believe that the S&A rate is too high for the services they receive. USACE is sensitive to that concern, and it periodically reviews its S&A rate structure to ensure that it is fair and reasonable. As part of the periodic review process, USACE requested our review of the construction management services it provides and the fee it charges for those services.

Our review identifies and defines the services that make up construction management, quantifies the USACE costs associated with providing those services, and compares USACE construction management costs to those experienced in the private sector. Our review only addresses USACE's Military Construction Program. It does not address the Civil Works Program. We developed a list of services that describes construction management as practiced by both USACE and the construction industry. The list of services (see Table 1) and their definitions were compiled from the Construction Management Association of America's (CMAA's) *Standard CM Services and Practice* manual. The definitions were used to identify the services provided to USACE customers and to compare them with services normally provided in the private sector. The definitions and the comparison of USACE's and the private sector's services are presented in Appendix A. The services provided by each USACE organizational level are shown in Appendix B.

We used project-level cost data in the review. However, due to system limitations, actual construction management cost records at the project level are not available through the Corps of Engineers Management Information System (COEMIS) – USACE's cost accounting system.

Table 1.
Construction Management Services

Predesign Phase Services	Project management
	Scheduling
	Cost management
	Contract/project administration
Design and Bid Phase Services	Project management
	Scheduling
	Contract/project administration
Construction Phase Services	Project management
	Scheduling
	Cost management
	Contract/project administration
	Quality assurance
Additional Services	Procurement of materials
	Value engineering
	Claims analysis and processing
	Administration of social programs
	Labor rates
	Post-construction activities

Note: See Appendix A for descriptions.

We obtained private-sector construction management cost data from a CMAA survey (see Appendix D). In that survey, construction management firms provided project-level data about the services they provide and their costs. The data were used to develop the private-sector costs for providing construction management services.

FINDINGS

We found from the CMAA-sponsored survey that few private-sector construction management firms provide all the services required for construction management. (See Appendix C for the survey results.) On average, private-sector firms provide their customers only 80 percent of the construction management services identified by the CMAA, whereas USACE normally provides all those services. Consequently, cost comparisons between USACE and the private sector must be adjusted to reflect the difference in services provided.

Most USACE customers are not aware of all the services they receive because the services are performed by different organizations within USACE, many of which are never seen by the customer (see Appendix B). In general, customers

see only field office staffs and consider their activities to be the construction management for which they are paying. The field office staffs perform about two-thirds of the construction management services; the other third is performed by USACE districts, divisions, and Headquarters (see Figure 1). Additionally, USACE customers are generally unaware that they are not charged for the services they receive from division offices and the USACE Headquarters because those organizations are funded with Operations and Maintenance Army funds. That funding saves USACE's customers approximately 4 percent of the total construction management cost.

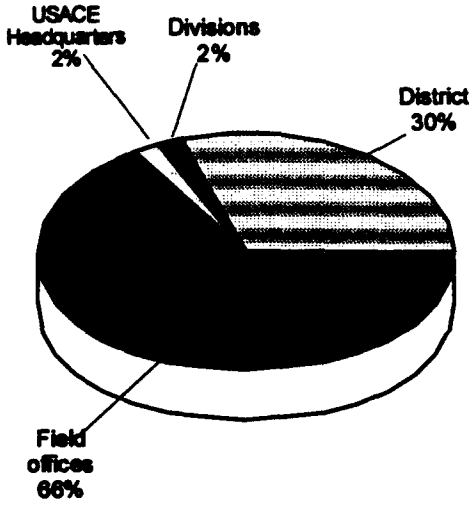


Figure 1.
Where USACE Construction Management Effort is Expended

The USACE construction management fee — the S&A rate — is divided among the four major categories of construction management services (see Figure 2). A discussion of the division is contained in Appendix B. Some construction management costs, 5.6 percent of the total, are associated with predesign, design, and bid phase services. Those phases are primarily concerned with the engineering aspects of the project, with which construction managers have limited involvement. Construction managers become more heavily involved during the construction phase where 75.7 percent of the construction management dollar is expended for services provided. Most of that effort is associated with the administration and inspection of the project during construction. The remaining 18.7 percent of cost is associated with providing additional services such as procurement of materials, postconstruction activities, and so forth.

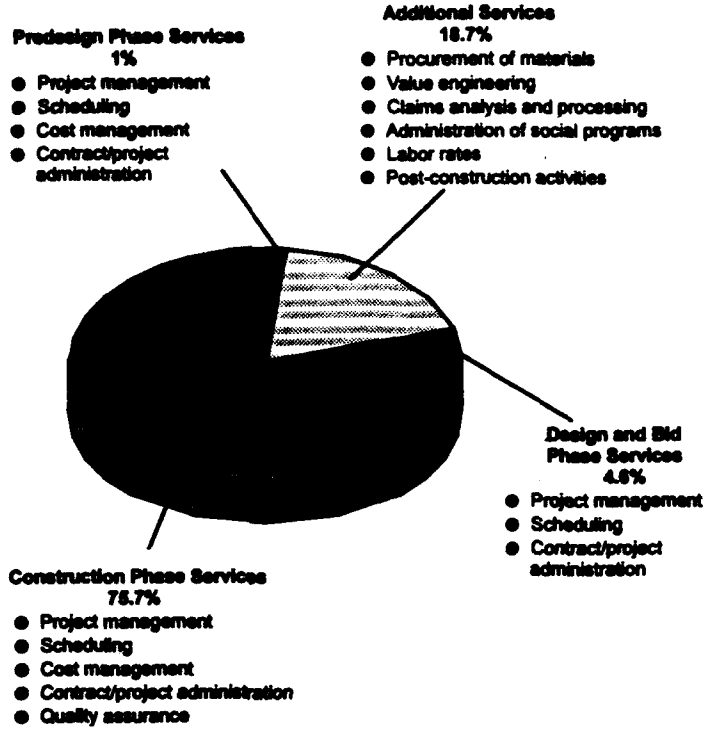


Figure 2.
Where the Construction Management Dollar Goes

Considerable misunderstanding exists about how the construction management fee, the so-called "flat-rate account," functions. Many customers incorrectly believe that the flat rate should recoup construction management costs on a project-by-project basis. The flat rate accounts are intended to recoup construction management costs from a *class* of projects such as military construction (MILCON) or operations and maintenance (O&M) work. The flat rate is used to minimize administrative burden and cost and implicitly recognizes that cross-subsidies occur within certain classes of projects. The classic example is the subsidizing of small projects by large projects. Customers who state that they are being overcharged for the services received on large or simple projects fail to realize that they are also being undercharged on small or complex ones. Over time, with a large number of projects, we believe the flat-rate approach is a reasonable alternative to charging actual costs at the project level.

Despite the differences in services available, USACE construction management costs and the private-sector fees can be put on a comparable basis. Before making a comparison, however, the private-sector fees must be adjusted to reflect the provision of full services -- the methodology for making this adjustment is described in Appendix C. The results of this comparison are shown in Table 2. USACE's S&A adjusted rates are generally at or below the average "full-

service" private-sector fees for the same type of work, and the USACE-weighted average cost is significantly less than that of the private sector.

Table 2.
Construction Management Cost Comparison

Customer	Adjusted private-sector full-service fee range (%)				USACE S&A rate (%)
	25th percentile	Median	75th percentile	Average	
Family housing — Army	2.9	5.3	8.0	6.1	6.0
Family housing — Air Force	2.9	5.3	8.0	6.1	6.0
MILCON — Army	4.9	6.6	12.2	12.2	6.0
MILCON — Air Force	4.9	6.6	12.2	12.2	6.0
MILCON — Army Reserves	5.0	6.9	11.2	9.4	6.0
O&M — Army	4.9	7.1	11.9	11.2	7.5
O&M — Air Force	5.0	7.1	11.7	11.6	7.5
Production base support	5.1	7.7	13.0	11.0	6.0
Defense environmental restoration program	6.5	12.1	16.8	6.1	NA

Note: MILCON = military construction; O&M = operations and maintenance; NA = not applicable.

CONCLUSIONS

Most USACE customers are not aware of all the construction management services they are provided (see Table 1). Customers see the work of the field offices but they do not normally see the 34 percent of the total construction management effort that is expended by other USACE organizations. These unseen services are critical to the management of a construction project. They are not unnecessary "frills" and must be performed by either the customer or the construction manager. Customers must be better educated about the services that they receive for their construction management dollar.

The USACE fees are appropriate for the services it provides. While many private-sector construction management firms appear to be less expensive than USACE, they do not provide the same level of service. This can be seen from the results of the CMAA survey in Appendix C. A tabulation of these results shows that, on average, private-sector firms only provide 80 percent of the services that USACE provides. When private-sector costs are adjusted as described in Appendix C to reflect the same level of service, USACE costs are actually lower.

RECOMMENDATIONS

We believe USACE construction management services and fees are consistent with industry practice. Communicating an accurate picture of USACE construction management services should be a top priority for districts, divisions, and the Headquarters. Failure to understand the complete story about construction management services being provided is at the root of much of the discontent exhibited by USACE customers. Therefore, we recommend that the USACE Chief of Construction develop a briefing package and a supporting brochure that can be presented to USACE military construction customers. The package should consist of slides and accompanying text that describes USACE S&A services. The brochure should be a "stand-alone" document that can be used by districts and divisions during discussions with customers.

We further recommend that the Chief of Construction provide copies of this report to all districts and divisions with a military construction mission. By taking these steps, we believe that USACE can significantly improve customer satisfaction.

APPENDIX A

A Comparison of Private-Sector and USACE Construction Management Services

A Comparison of Private-Sector and USACE Construction Management Services

The list of construction management services and responsibilities used in this study was developed by the Construction Management Association of America (CMAA). It is the generally accepted set of definitions used by the industry.

The list is split into two columns. The first column provides the CMAA list of all possible private-sector construction management services and their descriptions, while the second column describes the comparable service provided by the U.S. Army Corps of Engineers (USACE) together with the source of funds. In most cases, the private sector's and USACE's definition of service are the same, but there are two recurring differences: In the private sector, the owner (i.e., customer) normally retains contractual authority, and the construction manager only makes recommendations. USACE normally has this contractual authority, however, and therefore carries more responsibility than its private-sector counterpart. USACE also provides more of the services listed than does the average private-sector construction manager, and for some USACE-provided services, the private sector has no counterparts.

The CMAA list begins on the next page.

CONSTRUCTION MANAGEMENT SERVICES

CMAA	Corps of Engineers
1.0 PREDESIGN PHASE	
1.1 Project Management	
1.1.1 Construction Management Plan	
The construction manager (CM) prepares the Construction Management Plan for the project. He considers the owner's schedule, cost, and design requirements and develops various alternatives for the sequencing and management of the project. He then makes recommendations to the owner. The Construction Management Plan includes a description of the various bid packages recommended for the project and is presented to the owner for acceptance.	Same [funded mainly from planning and design (P&D)].
1.1.2 Design Professional Selection	
The CM assists the owner in the selection of a design professional by developing lists of potential firms, developing criteria for selection, preparing and transmitting the requests for proposal and assisting in reviewing written proposals, conducting interviews, evaluating candidates, and making recommendations.	Same (funded mainly from P&D).
1.1.3 Design Professional Contract Preparation	
The CM assists the owner in review and preparation of the agreement between the owner and the design professional.	Same (funded from P&D).
1.1.4 Design Professional Orientation	
The CM conducts or assists in conducting a design professional orientation session during which the design professional will receive information regarding project, schedule, cost, and administrative requirements.	Same [normally funded from P&D. Some supervision and administration (S&A) for large projects].
1.2 Scheduling	
1.2.1 Master Schedule	
In accordance with the Construction Management Plan, the CM prepares a master schedule for each component of the project. It specifies the proposed start and finish dates for each contract and the dates by which certain construction activities must be complete. The CM submits the master schedule to the owner for acceptance.	Same (funded from P&D).

CMAA	Corps of Engineers
1.2.2 Design Phase Milestone Schedule	
After the owner's acceptance of the master schedule, the CM prepares the milestone schedule for the design phase. That milestone schedule may be used in requests for proposals and the contract for the design professional, and is a method for judging progress during the design phase.	Same (funded from P&D).
1.3 Cost Management	
1.3.1 Construction Market Survey	
The CM conducts a construction market survey to provide current information on the general availability of local construction services, labor and material cost, and economic factors related to the project. A report of the survey is provided to the owner.	Same (funded from P&D).
1.3.2 Project and Construction Budget	
Based on the Construction Management Plan and the construction market survey, the CM prepares a project and construction budget and submits it to the owner for acceptance; the CM revises it as the owner directs.	Same (funded from P&D).
1.3.3 Cost Analysis	
The CM analyzes and reports to the owner the cost of various design and construction alternatives. As a part of this cost analysis, the CM considers costs related to efficiency, usable life, maintenance, energy, and operation. Value engineering studies may also be conducted.	Same (funded from P&D).
1.4 Contract/Project Administration	
1.4.1 Establishing the Project MIS	
The CM develops a management information system (MIS) to establish communication among the owner, CM, design professional, contractor, and other parties on the project. In developing the MIS, the CM interviews the owner's key personnel and others to determine the type of information for reporting, the reporting format, and the desired frequency for distribution of the various reports.	Same: Functions performed via Automated Management Progress Reporting System (AMPRS) Corps of Engineers Management Information System (COEMIS) (funded from P&D).
1.4.2 Design Phase Procedures	
As part of the MIS, the CM establishes procedures for reporting communications and administration during the design phase.	Same: Standard Corps of Engineers reports (funded from P&D).

CMAA	Corps of Engineers
2.0 DESIGN AND BID PHASE	
2.1 Project Management	
2.1.1 Revisions to the Construction Management Plan	
During the design phase, the CM makes recommendations to the owner regarding revisions to the Construction Management Plan. Revisions approved by the owner are incorporated into the Construction Management Plan.	Same (funded mainly from P&D).
2.1.2 Project Conference	
At the start of the design phase, the CM conducts a project conference attended by the design professional, the owner, and others. During the project conference, the CM reviews the Construction Management Plan, the master schedule, design phase milestone schedule, the project and construction budget, and the MIS.	Same (funded mainly from P&D).
2.1.3 Design Phase Information	
The CM monitors the design professional's compliance with the Construction Management Plan and the MIS and coordinates and expedites the flow of information among the owner, design professional, and others.	Same (funded from P&D).
2.1.4 Project Meetings	
The CM conducts periodic project meetings attended by the owner, design professional, and others. Such meetings serve as a forum for the exchange of information about the project and the review of design progress. The CM prepares and distributes minutes of these meetings to the owner, design professional, and others.	Same (funded mainly from P&D).
2.1.5 Review of Design Documents	
The CM reviews the design documents for clarity, consistency, and completeness. The results of the review are provided in writing and as notations on the documents. The CM is not responsible for providing, nor does the CM control, the project design and contents of the design documents. By performing the reviews described herein, the CM is not acting in a manner so as to assume responsibility or liability, in whole or in part, for all or any part of the project design and design documents. The CM's actions in reviewing the project design and design documents and in making recommendations as provided herein, are only advisory to the owner.	The Corps is responsible to the owner for the quality of the design (funded from P&D and some S&A).

CMAA	Corps of Engineers
2.1.6 Design Recommendations	
The CM makes recommendations to the owner and design professional with respect to constructibility, construction cost sequence of construction, construction duration, and separation of the project into contracts for various categories of the work.	Same (funded from P&D and some S&A).
2.1.7 Owner's Design Reviews	
The CM expedites the owner's design reviews by compiling and conveying the owner's comments to the design professional.	Same (funded from P&D).
2.1.8 Approvals by Regulatory Agencies	
The CM coordinates transmittal of documents to regulatory agencies for review, and advises the owner of potential problems in completion of such reviews.	Same (funded from P&D).
2.1.9 General Conditions	
The general conditions to the contract documents for the project are CMAA Document No. A-3. Separate general conditions for materials and for equipment procurement are prepared by the CM to meet the specific requirements of the project.	The Corps uses the government's standard "General Conditions" (funded from P&D and S&A).
2.1.10 Public Relations	
The CM assists the owner in public relations activities. He prepares information for and attends public meetings.	Same (funded from P&D).
2.1.11 Project Funding	
The CM assists the owner in preparing documents concerning the project and construction budget for obtaining or reporting on project funding. The documents are prepared in a form approved by the owner.	Same: Standard government forms are used (funded from P&D).
2.1.12 Prequalifying Bidders	
The CM assists the owner in developing lists of possible bidders and in prequalifying bidders. This service includes the following: (1) preparation and distribution of questionnaires; (2) receiving and analyzing completed questionnaires; (3) interviewing possible bidders, bonding agents, and financial institutions; and (4) preparing recommendations for the owner. The CM prepares a bidders' list for each bid package.	Same, but rarely used except for very large or very unusual jobs (funded from P&D and S&A).
2.1.13 Notices and Advertisements	
The CM assists the owner in preparing and placing notices and advertisements to solicit bids for the project.	Same (funded from P&D).

CMAA	Corps of Engineers
2.1.14 Delivery of Bid Documents	
The CM expedites the delivery of bid documents to the bidders. He obtains the documents from the design professional and arranges for printing, binding, wrapping and delivery to the bidders. He also maintains a list of the bidders receiving bid documents.	Same (funded from P&D).
2.1.15 Bidder's Interest Campaign	
The CM conducts a telephonic and correspondence campaign to attempt to increase interest among qualified bidders.	Same where and when appropriate (funded from P&D).
2.1.16 Pre-bid Conference	
In conjunction with the owner and design professional, the CM conducts pre-bid conferences. These conferences are a forum for the owner, CM, and design professional to explain the project requirements to the bidders including the schedule, time and cost control, access requirements, the owner's administrative requirements, and technical information.	In addition, the Corps performs site visits with potential contractors on large jobs (funded mainly from S&A with some P&D).
2.1.17 Information to Bidders	
The CM develops and coordinates procedures to provide answers to the bidders' questions.	Same (funded from P&D and some S&A).
2.1.18 Addenda	
The CM receives from the design professional a copy of all addenda. He reviews them for clarity, consistency, and completeness and distributes copies to each bidder. The CM does not assume responsibility or liability for the project design contents or the design documents.	Same (funded from P&D and some S&A).
2.1.19 Bid Opening and Recommendations	
The CM assists the owner in the bid opening, and evaluates the bids for responsiveness and price. He makes recommendations to the owner concerning the acceptance or rejection of bids.	The Corps makes the decision on acceptance or rejection of bids. With negotiated contracting, there is significant Construction Division involvement (funded from P&D and a little S&A).
2.1.20 Post-bid Conference	
The CM conducts a post-bid conference to review contract award procedures, schedules, project staffing, and other pertinent issues.	The Corps does not perform this service.
2.1.21 Construction Contracts	
The CM assists the owner in the preparation, delivery, and execution of the contract documents and issues the notice to proceed on behalf of the owner.	Same (funded from P&D).

CMAA	Corps of Engineers
2.1.22 Preconstruction Conference	
The CM conducts, in conjunction with the owner and design professional, a preconstruction conference during which the CM states the project reporting procedures and other rules.	Same (funded from S&A).
2.1.23 Permits, Insurance, and Labor Affidavits	
The CM verifies that the contractor has secured the rerquired building permits, bonds, insurance, labor affidavits and waivers. This action does not relieve the contractor of his responsibility to comply with provisions of the contract documents.	Same (funded from S&A and some P&D).
2.2 Scheduling	
2.2.1 Revisions to Master Schedule	
While performing the services provided in Paragraphs 2.1.1, 2.1.2, and as necessary throughout the design phase, the CM recommends revisions to the master schedule. The owner will issue, as needed, change orders to the appropriate parties to implement the master schedule revisions.	The Corps issues change orders after advising the owner (funded from P&D).
2.2.2 Monitoring the Design Phase Milestone Schedule	
While performing the services provided in Paragraph 2.1.3 and 2.1.4, the CM monitors compliance with the design phase milestone schedule.	Same (funded from P&D).
2.2.3 Pre-Bid Construction Schedules	
Prior to transmitting contract documents to bidders, the CM prepares a pre-bid construction schedule for each part of the project and makes it available to the bidders during the bid and award phase.	Same, but the Corps provides this service only on large, complex projects with phasing (funded by P&D).
2.2.4 Contractor's Construction Schedule	
The CM provides a copy of the master schedule to the bidders. As a part of the notice of an award, he informs each contractor of the requirements for the preparation of the contractor's construction schedule. Each contractor prepares his own construction schedule, which provides for completing the work in accordance with the milestone dates in the master schedule. The CM reviews the contractor's construction schedule and determines whether it establishes completion dates that comply with the requirements of the master schedule and the contract documents.	Same, but only used for large complex projects (funded from S&A).

CMAA	Corps of Engineers
2.3 Contract/Project Administration	
2.3.1 Project and Construction Budget Revision	
The CM makes recommendations to the owner on design changes that may result in revisions to the project and construction budget.	Same (funded from S&A with some P&D).
2.3.2 Cost Control	
The CM prepares an estimate of the construction cost for each submittal of design drawings and specifications from the design professional. The estimate for each submittal is accompanied by a report to the owner and design professional identifying variances from the project and construction budget. The CM coordinates and expedites the activities of the owner and design professional when changes to the design are required to remain within the project and construction budget.	Same: It is used for developing the current working estimate (funded from P&D).
2.3.3 Value Analysis Studies	
The CM provides value analysis studies on major construction components. The results of these studies are in report form and are distributed to the owner, design professional, and others.	Same (funded from P&D).
2.3.4 Tradeoff Studies	
The CM provides tradeoff studies for various minor construction components. The results of the tradeoff studies are in report form and are distributed to the owner, design professional, and others.	Same: This could be part of value analysis (funded from P&D).
2.3.5 Management Information Systems (MIS)	
2.3.5.1 Schedule Reports. In conjunction with the services provided by Paragraph 2.1.4, the CM prepares and distributes schedule maintenance reports to compare actual progress with scheduled progress for the design phase and the overall project.	Same: Provided via AMPRS (funded from P&D).
2.3.5.2 Project Cost Reports. The CM prepares and distributes project cost reports which specify estimated costs compared to the project and construction budget.	Same: Provided via AMPRS and COEMIS (funded from P&D).
2.3.5.3 Cash Flow Report. The CM periodically prepares and distributes a cash flow report.	Same: COEMIS, 3011A and 3011C reports (funded from P&D).

CMAA	Corps of Engineers
2.3.6.4 Design Phase Change Order Report. The CM prepares and distributes design phase change order reports, which list all owner-approved change orders as of the date of the report, and state the effects of the change orders on the project and construction budget, and the master schedule.	Same (funded from (P&D).
2.3.6 Estimates for Addenda	
The CM prepares an estimate of cost for all addenda and submits the estimates to the owner for approval. After approval by the owner, the addenda are transmitted to bidders.	Same (funded from (P&D).
2.3.7 Analyzing Bids	
Upon receipt of the bids, the CM evaluates them, including alternate prices and unit prices.	Same (funded from P&D and S&A).
3.0 CONSTRUCTION PHASE	
3.1 Project Managment	
3.1.1 On-site Management and Construction Phase Communication Procedures	
The CM provides and maintains a management team on the project site to provide contract administration as an agent of the owner, and he establishes and implements coordination and communication procedures among the CM, owner, design professional, contractors, and others.	Same: Includes claims (funded from S&A).
3.1.2 Construction Administration Procedures	
The CM establishes and implements procedures for requests for information, shop drawings and material sample submittals, contract schedule adjustments, change orders, payment requests, and the maintenance of logs. The CM maintains daily job reports. As the owner's representative at the construction site, the CM receives requests for information, submittals, contractor schedule, adjustment, change order requests, and payment requests.	The Corps also includes the review of shop drawings (funded from S&A).
3.1.3 Project Site Meetings	
Periodically, the CM conducts meetings at the project site with each contractor, and conducts coordination meetings with all contractors, the owner, and the design professional. The CM records, transcribes, and distributes minutes to all attendees, the owner, design professional, and others.	Same (funded from S&A).

CMAA	Corps of Engineers
3.1.4 Coordination of Independent Consultants	
Technical inspecion and testing provided by the design professional or other parties are coordinated by the CM. The CM is provided a copy of all inspection and testing reports on the day of the inspection or test. The CM is not responsible for providing, nor does the CM control the actual performance of technical inspection and testing. The CM is performing a coordination function and is not assuming responsibility or liability for such inspection and testing.	The Corps takes a more active role. Testing is done by quality assurance, not through a design professional (funded from S&A).
3.1.5 Substantial Completion	
In conjunction with the design professional, the CM determines when the project and the contractor's work is substantially complete. Prior to issuing a certificate of substantial completion, the CM, in conjunction with the design professional, prepares a list of incomplete work which does not conform to the contract documents. This is attached to the certificate of substantial completion.	An outside design professional is not involved (funded from S&A).
3.1.6 Final Completion	
In conjunction with the design professional, the CM determines when the project and the contractor's work is finally complete, and issues a certificate of final completion.	Done via Defense Department (DD) Form 1354. The Corps also tracks fiscal completion (funded from S&A).
3.1.7 Review of Requests for Changes to the Contract Time or Price	
The CM reviews the contents of a request for a change to the contract time or price submitted by a contractor, assembles information concerning the request, endeavors to determine the cause of the request, and makes recommendations to the owner with respect to acceptance of the request.	The Corps normally makes decisions on the construction change orders and advises the owner if costs are within the contingency amounts unless the owner has directed different procedures (funded from S&A).
3.1.8 Operations and Maintenance Materials	
The CM receives from the contractor operations and maintenance manuals, warranties and guarantees for materials and equipment installed in the project.	Same (funded from S&A).
3.2 Scheduling	
3.2.1 Master Schedule	
The CM adjusts and updates the master schedule and distributes copies to the owner and design professional. Adjustments to the master schedule are made for the benefit of the project.	Same, but only used for large, complex projects (funded by S&A).

CMAA	Corps of Engineers
3.2.2 Contractor's Construction Schedule	
The CM reviews the contractor's construction schedule and verifies that it complies with the requirements of the contract documents.	Same (funded from S&A).
3.2.3 Schedule Compliance Review	
The CM reviews the progress of construction of each contractor on a monthly basis, evaluates the percentage complete of each construction activity as indicated in the contractor's construction schedule, and reviews percentages with the contractor. This evaluation serves as data for input to the periodic construction schedule report which is prepared and distributed to the contractor, owner, and design professional. The report indicates the actual progress compared to scheduled progress and serves as the basis for the progress payments to the contractor. The CM advises and makes recommendations to the owner concerning the alternative courses of action that the owner may take in its efforts to achieve contract compliance by the contractor.	The Corps usually takes action without owner involvement. Coordination with the owner is needed only for expediting or accelerating the project (funded from S&A).
3.2.4 CM Review of Time Extension Requests	
The CM advises the owner on the effect on the master schedule of time extensions requested by the contractor prior to the issuance of a change order.	Same (funded from S&A).
3.2.5 Recovery Schedules	
The CM may require the contractor to prepare and submit a recovery schedule, as specified in the contract documents.	Same (funded from S&A).
3.3 Cost Management	
3.3.1 Allocation of Cost to the Contractor's Construction Schedule	
The contractor's construction schedule has the total contract price allocated among the contractor's scheduled activities so that each of the contractor's activities is allocated a price. The CM reviews the total contract price allocations and verifies that such allocations are made in accordance with the requirements of the contract documents. Progress payments are based on the contractor's percentage of completion of the scheduled activities as set out in the construction schedule report.	Same (funded from S&A).

CMAA	Corps of Engineers
3.3.2 Change Order Control	
The CM establishes and implements a change order control system. All proposed change orders are first described in detail in a request for a proposal to the contractor and are accompanied by technical drawings and specifications prepared by the design professional. In response to the request for a proposal, the contractor submits to the CM for evaluation, detailed information concerning the costs and time extensions, if any, to perform the proposed change work order. The CM discusses the proposed change order with the contractor and endeavors to determine the contractor's basis for the cost to perform the work. The CM makes recommendations to the owner prior to execution of change orders being incorporated into the contractor's construction schedule.	Same (funded from S&A).
3.3.3 Project Site Meetings	
Periodically the CM conducts meetings at the project site with each contractor, and the owner and design professional. The CM records, transcribes, and distributes minutes to all attendees, the owner, design professional, and others.	Same except for distribution (funded from S&A).
3.3.4 Cost Records	
In instances in which a lump sum or unit price is not determined prior to performing work described in a request for a proposal, the CM requests from the contractor, records of the cost of payroll, materials, and equipment, and the amount of payments to subcontractors for performing such work.	Same (funded from S&A).
3.4 Contract/Project Administration	
3.4.1 Schedule Maintenance Reports	
The CM prepares and distributes schedule maintenance reports during the construction phase. The report compares the actual construction dates with scheduled construction dates of each separate contract and the master schedule for the project.	Same (funded from S&A).
3.4.2 Project Cost Reports	
The CM prepares and distributes project cost reports during the construction phase; those reports compare actual project and construction costs with the project and construction budget.	Reports are produced by COEMIS and AMPRS. The Corps includes financial completion and return of surplus funds, and there are additional government financing requirements (funded from S&A).

CMAA	Corps of Engineers
3.4.3 Project and Construction Budget Revisions	
The CM makes recommendations to the owner on construction changes that may result in revisions to the project and construction budget.	The Corps handles additional government financing requirements (funded from S&A).
3.4.4 Cash Flow Reports	
The CM prepares and distributes cash flow reports during the construction phase. The reports compare actual cash flow to projected cash flow.	Same: COEMIS 3011A, and 3011C reports (funded from S&A).
3.4.5 Progress Payment Reports (Each Contract)	
The CM prepares and distributes the progress payment reports. These reports state the total construction contract price, payment to date, current payment requested, retainage, and actual amounts owed this period. One portion is a certificate of payment signed by the CM and delivered to the owner for use by the owner in making payments to the contractor.	Same (funded from S&A).
3.4.6 Change Order Reports	
The CM periodically prepares and distributes change order reports during the construction phase. The reports list all owner-approved change orders by number, a brief description of the change order work, the cost established in the change order and percent of completion of the charge order work.	Same (funded from S&A).
3.4.7 Contractor's Safety Program Report	
The CM reports to the owner when the contractor notifies the CM that the contractor has prepared a contractor's safety program as required by the contract documents.	In addition, the Corps enforces accident reporting and investigation procedures, safety inspections, and safety meetings (funded from S&A).

CMAA	Corps of Engineers
3.5 Quality Assurance	
The CM establishes and implements a program to monitor the quality of the construction to assist in guarding against defects and deficiencies in the work of the contractor. The CM rejects work and transmits to the owner and contractor a notice of nonconforming work when it is the opinion of the CM, owner, or design professional that the work does not conform to the requirements of the contract documents. The CM, in conjunction with the design professional, makes recommendations to the owner for corrective action. The CM is not authorized to change or release any requirements of the contract documents. All changes to the agreement between the owner and contractor are by change orders executed by the owner. Communication between the CM and contractor with regard to quality review is not in any way to be construed as binding the CM or owner to release the contractor from the fulfilment of any of the terms of his contract documents. The CM is not responsible for, nor does the CM control, the means and methods of construction for the project. It is understood that the CM's action in providing quality review is a service to the owner and the CM is not assuming responsibility or liability for the contruction work for the project.	The Corps of Engineers' quality assurance program is similar to that defined in Paragraph 3.5 except that the Corps assumes the responsibilities and authorities that Paragraph 3.5 assigns to the owner. The contractual relationship is between the contractor and the Corps, not the owner (funded from S&A).
4.0 ADDITIONAL SERVICES	
4.1 Procurement of Materials	
The CM provides procurement services for the owner as designated to include review of specifications, using purhase orders, and overseeing the delivery and storage of materials.	Same (funded from S&A).
4.2 Value Engineering	
The CM arranges for and conducts value engineering analyses on aspects of the project where appropriate.	Same (funded from S&A although costs are carried in most cases through savings).
4.3 Claims Analysis and Processing	
Same as 3.1.7.	The Corps handles the processing, resolution, and negotiation of claims (funded from S&A).

CMAA	Corps of Engineers
4.4 Administration of Social Programs	
Not applicable.	The Corps is involved in the administration of programs legislated to help small, disadvantaged, and minority businesses (funded from S&A).
4.5 Labor Rates	
Not applicable.	The Corps administers the Davis-Bacon Act legislation, which sets minimum wage rates for government construction (funded from S&A).
4.6 Post Construction Actions	
Not applicable.	The Corps is responsible for the administration of warranties and guaranties (funded from S&A).

APPENDIX B

The Composition of Construction Management Costs in USACE

The Composition of Construction Management Costs in USACE

FINDINGS

Construction management in the U.S. Army Corps of Engineers (USACE) is divided among four organizational levels: field offices, districts, divisions, and the Corps' Headquarters (HQ). Only the field offices and districts charge their efforts directly to the customer. Division and Corps HQ support is funded from operations and maintenance Army (OMA) appropriations. When comparing Corps costs with private-sector costs, we must differentiate between the suppliers of the services and the services provided. Table B-1 shows the percentage of construction management *effort expended* for each category of service and Table B-2 shows *where* construction services are performed. The division and USACE HQ columns show free services provided to the Corps' customers.

The data in this appendix describe the expenditure of construction management effort and where those construction management services are performed. Results were derived by an experienced panel of experts drawn from a variety of organizational levels within USACE. Two techniques were used to derive the results.

In Table B-1, the alternatives were the construction service categories, and the decision was how much construction management effort is expended for each service. Through a series of comparisons, the "Expert Choice" software assigned relative weights to the alternatives while monitoring the consistency of the panel's judgments. Expert Choice is a systematic approach that supports the decision-makers in comparing alternatives when many criteria are involved.

We identified where construction management services are performed by developing a consensus of the panel about the services provided by each organization (see Table B-2). For the expenditure of construction management effort, the panel used Expert Choice to aid in decision making. In Table B-2, the four organizational levels involved in construction management are shown as well as the effort expended at each level for each of the categories of service.

Table B-1.
Expenditure of Construction Management Effort by USACE

Service phase			Percentage of construction management costs
1.0	**Predesign Phase**		**1.0**
	1.1	Project management	0.7
	1.2	Scheduling	0.1
	1.3	Cost management	0.1
	1.4	Contract/project administration	0.1
2.0	**Design and Bid Phase**		**4.7**
	2.1	Project management	3.3
	2.2	Scheduling	0.7
	2.3	Contract/project administration	0.7
3.0	**Construction Phase**		**75.6**
	3.1	Project management	20.3
	3.2	Scheduling	4.9
	3.3	Cost management	4.1
	3.4	Contract/project administration	7.0
	3.5	Quality assurance	39.3
4.0	**Additional**		**18.7**
	4.1	Procurement of materials	0.5
	4.2	Value engineering	0.9
	4.3	Claims analysis and processing	7.2
	4.4	Administration of social programs	1.9
	4.5	Labor rates	2.0
	4.6	Post-construction activities	6.2
Total			100

Table B-2.
Where USACE's Construction Management Services are Performed

Service phase		USACE Service provider			
		Field office	District	Division	USACE HQ
1.0	**Predesign Phase**	**1.0%**	**96.0%**	**2.5%**	**1.5%**
1.1	Project management	2.0	93.0	3.0	2.0
1.2	Scheduling	0.0	96.0	3.0	1.0
1.3	Cost management	0.0	97.0	2.0	1.0
1.4	Contract/project administration	0.0	96.0	2.0	0.0
2.0	**Design and Bid Phase**	**4.0**	**92.0**	**3.0**	**1.0**
2.1	Project management	10.0	84.0	5.0	1.0
2.2	Scheduling	0.0	98.0	2.0	0.0
2.3	Contract/project administration	0.0	98.0	2.0	0.0
3.0	**Construction Phase**	**76.0**	**20.0**	**2.0**	**2.0**
3.1	Project management	84.0	15.0	1.0	0.0
3.2	Scheduling	92.0	7.0	0.5	0.5
3.3	Cost management	90.0	8.0	1.0	1.0
3.4	Contract/project administration	48.0	48.0	2.0	2.0
3.5	Quality assurance	84.0	10.0	2.0	4.0
4.0	**Additional**	**48.0**	**49.0**	**2.0**	**1.0**
4.1	Procurement of materials	25.0	75.0	0.0	0.0
4.2	Value engineering	35.0	63.0	2.0	0.0
4.3	Claims analysis and processing	58.0	40.0	1.0	1.0
4.4	Admin. of social programs	10.0	87.0	2.0	1.0
4.5	Labor rates	90.0	10.0	0.0	0.0
4.6	Post-construction activities	90.0	8.0	1.0	1.0

APPENDIX C

Private-Sector Construction Management Costs and a Methodology for Adjusting Them to Reflect Full-Service Costs

Private-Sector Construction Management Costs and a Methodology for Adjusting Them to Reflect Full-Service Costs

INTRODUCTION

The construction management industry in the United States is relatively new. In contrast to the engineering industry, it has little data available to describe the fees charged for providing construction management services. Until recently, few agreed on the services that constituted construction management. In response, the Construction Management Association of America (CMAA) published the CMAA *Standard CM Services and Practices* manual, which describes in detail the services that constitute construction management. In a parallel effort, CMAA also collected data on the fees charged to provide those services. The data collected are shown in this appendix, and the questionnaire used for that purpose is presented at Appendix D.

The results of CMAA's survey clearly point out that there is a wide range in the number of services provided by construction management firms. On average, these firms provide only 80 percent of the services that a full-service company would provide. Thus, the fees for any given project must be adjusted to reflect the services provided before comparing costs to the Corps of Engineers, which is a full-service organization. The basis for the adjustment was a quantification of the relative costs of providing construction management services as described in Appendix B.

Each private-sector construction project cost was brought up to a full-service cost by adding the costs for missing services as a percentage of the reported costs. The distribution of the adjusted costs was then used in the comparison of USACE construction management costs to those of the private sector.

SURVEY RESPONSES

The survey was sent out in October 1993 to 190 of the CMAA's members – companies that perform construction management (CM) functions. Table C-1 summarizes the response information.

Table C-1.
Summary of Valid Survey Responses

	Number of responses
Companies mailed surveys	190
Valid company responses	35
Valid project responses	167

GENERAL COMPANY DATA AND RESPONSE RATES

Figure C-1 shows the distribution of valid company responses, classified by the company's predominant type of work. It shows the category best representing the firms' predominant types of work. A plurality of respondents (57 percent) classified themselves as pure CM companies. Others classified themselves as a combination of CM and general contractor (GC) (20 percent) or CM/architect-engineer (A-E) (23 percent). This result closely parallels CMAA's corporate membership distribution by company type.

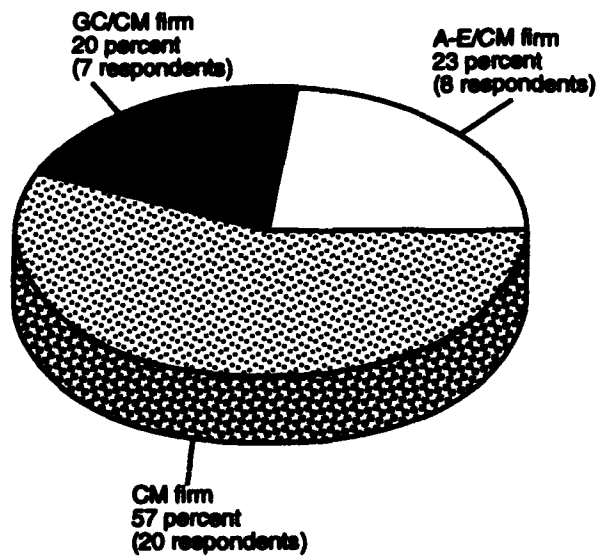
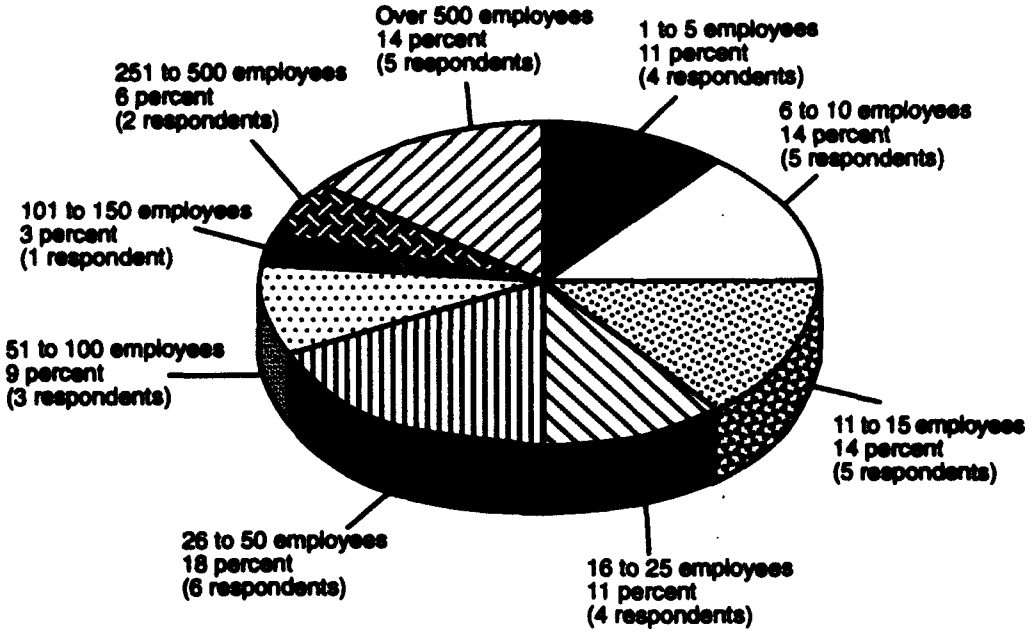


Figure C-1.
Survey Respondent Distribution by Type of Company

Figure C-2 shows the distribution of the valid responses by total staff size. The companies were asked to give full-time equivalents for their part-time and consultant staffs. Most of the responses were from smaller CM companies, with 68 percent reporting 50 or fewer employees.



Note: No responses were received in the 151 – 250 employee range.

Figure C-2.
Survey Respondent Distribution by Company Size

The distribution by clientele is shown in Figure C-3. Companies were classified as having either private-sector or government clientele if they indicated that

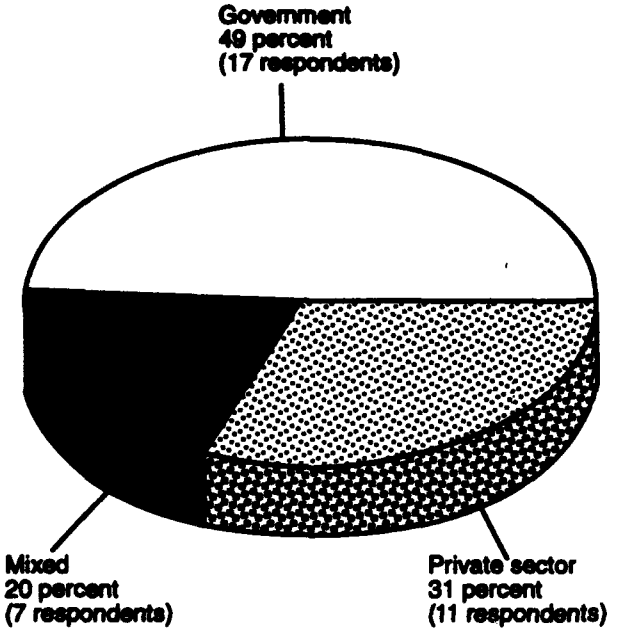


Figure C-3.
Survey Respondent Distribution by Predominant Clientele

at least 75 percent of their contracts came from either of those sources alone; otherwise, they were said to be mixed.

Table C-2 summarizes company data on fees charged by CM companies, CM companies' customers, and the percentage of government and private-sector contracts. The "negotiated fixed fee" contract was the most popular type of fee structure, with the "time spent" contract the second most popular type. Table C-2 also shows that most private-sector CM work is for educational/institutional clients, corporate/industrial clients, corporate/administrative/commercial clients, health care providers, and commercial developers.

Table C-2.
General Company Data

Company data	Mean[a]
Types of fees charged by company participants	
Negotiated fixed fee	33%
Lump sum bid	15
Cost plus fixed fee	11
Time spent (with maximum or time and materials)	21
Percentage of construction contract	14
Other	5
Types of customers	
Health care providers	9%
Corporate/industrial	13
Housing/lodging	4
Commercial developers	5
Corporate/administrative/commercial	11
Educational/institutional	22
Private religious/cultural	4
State and local government	22
Environmental Protection Agency	1
Transportation departments	6
Department of Defense	2
Other Federal	1
Types of clientele	
Government clients	57%
Private-sector clients	43

Note: Percentages may not add to 100 percent because of rounding.

DIRECT AND INDIRECT COST DATA

The summary of direct and indirect costs as a percentage of total CM revenues is presented in Table C-3. The median, 25th percentile, and 75th percentile are shown for all the valid responses. The data are analyzed by size and type of company.

Table C-3.
Summary of Direct and Indirect CM Costs (as a percentage of CM revenues)

	Number of participants	Direct labor expenses			Payroll burden			G&A labor expenses		
		25th	Median	75th	25th	Median	75th	25th	Median	75th
Overall	35	18%	39%	45%	8%	11%	16%	5%	13%	20%
Size of company (number of employees)										
1 – 15	15	25	45	60	10	13	20	2	11	20
Over 15	20	12	33	41	8	11	13	5	16	20
Type of company										
CM firm	21	20	41	55	8	10	19	3	12	20
GC/CM firm	6	5	10	36	3	11	45	5	7	34
A-E/CM firm	8	28	40	41	11	12	14	10	16	28

	Number of participants	G&A nonlabor expenses			Nonlabor direct expenses			Annual operating income		
		25th	Median	75th	25th	Median	75th	25th	Median	75th
Overall	35	5%	10%	22%	3%	6%	11%	3%	10%	85%
Size of company (number of employees)										
1 – 15	15	5	5	13	2	5	9	4	46	100
Over 15	20	7	19	24	3	8	13	3	8	60
Type of company										
CM firm	21	4	10	20	3	6	9	4	65	100
GC/CM firm	6	6	8	39	2	8	85	1	4	10
A-E/CM firm	8	8	19	31	4	7	11	2	7	44

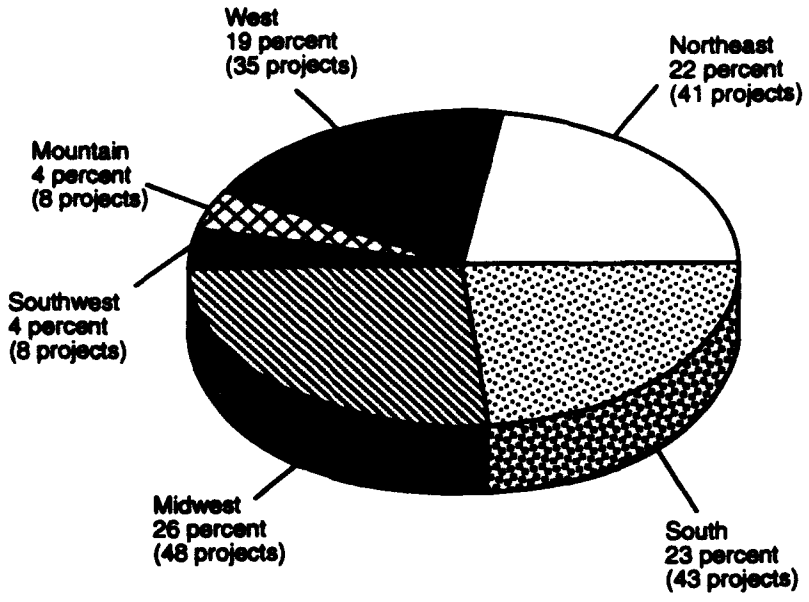
The results in Table C-3 simply show how the industry is allocating direct and indirect CM costs. They are by no means intended as *guidance* for that purpose. As can be expected, the way each company allocated its costs varied widely. However, the median responses from participants indicate they tend to allocate about 39 percent of their costs to direct labor, about 23 percent to general and administrative (G&A) expenses and labor, about 11 percent to payroll burden, and about 6 percent to nonlabor direct expenses. Since accounting practices are so varied among the participants, it is difficult to draw conclusions from these results. However, if these results are compared with the project cost data and level of services provided, it appears that CM costs increased slightly while

the amount of services provided also increased. We asked for annual operating income as a percentage of CM revenues; the median is 10 percent, with wide variation by the size or type of company.

Individual Construction Project Data

In the last part of the survey, participants were asked to submit information on as many as 12 individual construction projects for which their companies had performed CM services. The survey asked for type of construction project, project location, scope of the project (i.e., new construction or renovation), type of contract (CM as owner's agent or CM provides guaranteed maximum price), the basis for internally estimating the CM contract value, and the value of both the CM and construction contracts.

Figure C-4 shows the distribution of the 183 projects for which the geographic location of the construction site was reported. The places where the projects were managed are important, since geographic location affects the cost of services provided. (*Note:* Geographic location was not identified for four projects.) The information from this survey indicates that CMAA members are performing most of their CM work in the Northeast, South, Midwest, and West. That finding is consistent with the findings of the 1989 survey. Once again, these results are strongly a function of the type of CM companies that participated. Results should not be interpreted as a major industry trend.



Breakdown of geographic regions by states

Region	States
Northeast	CT, DE, MA, MD, ME, NH, NJ, PA, RI, VT
South	AL, AR, DC, FL, GA, KY, LA, MS, NC, SC, TN, VA, WV
Midwest	IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI
Southwest	AZ, NM, OK, TX
Mountain	CO, ID, MT, NV, WY, UT
West	AK, CA, HI, OR, WA

Figure C-4.
Distribution of Construction Projects by Geographic Region

Table C-4 shows the distribution of the 187 valid project responses by project type. It indicates specific types of construction projects the participants reported in the survey, and it shows the sources of data used in the project summaries.

The 49 types of construction projects were aggregated into fund-type categories. Table C-5 shows how the various types of construction tasks were grouped together into the construction categories for this purpose. The projects were grouped by similarities in the type of construction management performed for the various construction types within the general type of customer project. The project statistics for each construction category are summarized in Tables C-8 through C-19.

Table C-4.
Distribution of Valid Responses by Project Type

Category and project type	Number of projects	Percentage of total
Health care providers	**19**	**10.2**
(01) Hospitals	6	3.2
(03) Clinics/outpatient facilities	8	4.3
(04) Medical offices	1	0.5
(05) Extended care/nursing homes	4	2.1
Corporate/industrial	**17**	**9.1**
(06) Warehouse/distribution centers	4	2.1
(07) Light industrial	3	1.6
(08) Process plants/heavy industrial	10	5.3
Housing/lodging	**17**	**9.1**
(09) Hotels (high rise)	1	0.5
(10) Motels (low rise)	1	0.5
(11) Apartments/condominiums (High Rise)	1	0.5
(12) Apartments/condominiums (Low Rise)	9	4.8
(13) Single family housing	5	2.7
Commercial developers	**12**	**6.4**
(14) High Rise office building	6	3.2
(15) Mid Rise office building	4	2.1
(16) Low rise office building	0	0.0
(17) Shopping malls (enclosed)	2	1.1
(18) Strip shopping centers	0	0.0
Corporate/administrative/commercial	**13**	**7.0**
(19) General offices	8	4.3
(20) Retail stores	4	2.1
(21) Restaurants	1	0.5
Educational/institutional	**53**	**28.3**
(22) Classrooms	40	21.4
(23) Science/research labs	4	2.1
(24) Dormitories/housing	4	2.1
(25) Sports/athletic facilities	5	2.7

Note: Percentages may not add to 100 percent because of rounding. The two-digit number in parentheses refers to CMAA survey project type.

Table C-4.
Distribution of Valid Responses by Project Type (Continued)

Category and project type	Number of projects	Percentage of total
Private religious/cultural	**3**	**1.6**
(26) Churches	3	1.6
(27) Theaters/auditoriums	0	0.0
State and local government	**16**	**8.6**
(28) Office buildings	7	3.7
(29) Museums/galleries	6	3.2
(30) Correctional facilities	3	1.6
Environmental Protection Agency	**11**	**5.9**
(31) Water treatment plants	2	1.1
(32) Wastewater treatment	3	1.6
(33) Hazardous waste facilities	3	1.6
(34) Water/sewer lines	3	1.6
Transportation departments	**10**	**5.3**
(35) Bridges	2	1.1
(36) Roads	5	2.7
(37) Tunnels	0	0.0
(38) Airports	3	1.6
Department of Defense	**5**	**2.7**
(39) Military housing	0	0.0
(40) Military offices	1	0.5
(41) Military training facilities	0	0.0
(42) Military medical facilities	0	0.0
(43) Piers/wharfs	3	1.6
(44) Dredging	0	0.0
(45) Locks and dams	0	0.0
(46) Reservoirs	1	0.5
(47) Channel protection	0	0.0
(48) Beach stabilization	0	0.0
Other Federal	**11**	**5.9**
(49) Office buildings	10	5.3
(50) Postal facilities	1	0.5

Note: Percentages may not add to 100 percent because of rounding. The two-digit number in parentheses refers to CMAA survey project type.

Table C-5.
Mapping of Private-Sector Project Types to Corps of Engineers Fund Types

USACE fund types	Code	Private-sector project types
Military Construction (MILCON)		
Family Housing — Army	(11)	Apartments/Condos (High Rise)
	(12)	Apartments/Condos (Low Rise)
	(13)	Single Family Housing
Family Housing — Air Force	(11)	Apartments/Condos (High Rise)
	(12)	Apartments/Condos (Low Rise)
	(13)	Single Family Housing
Foreign Military Sales	(07)	Light Industrial
	(28)	Office Buildings
	(38)	Airports
	(40)	Military Offices
	(41)	Military Training Facilities
	(42)	Military Medical Facilities
Host Nation	(01)	Hospitals
	(07)	Light Industrial
	(24)	Dormitories/Housing
	(25)	Sports/Athletic Facilities
	(28)	Office Buildings
	(31)	Water Treatment Plants
	(36)	Roads
	(39)	Military Housing
	(40)	Military Offices
	(41)	Military Training Facilities
	(42)	Military Medical Facilities
	(49)	Federal Office Buildings
MILCON — Army	(01)	Hospitals
	(03)	Clinics/Outpatient Facilities
	(04)	Medical Office

Note: The two-digit number in parentheses refers to the CMAA survey project category code.

Table C-5.
Mapping of Private-Sector Project Types to Corps of Engineers Fund Types (Continued)

USACE fund types	Code	Private-sector project types
Military Construction (continued)		
MILCON — Army (continued)	(06)	Warehouse/Distribution Centers
	(07)	Light Industrial
	(10)	Motels (Low Rise)
	(16)	Low Rise Office Buildings
	(19)	General Offices
	(24)	Dormitory/Housing
	(25)	Sports/Athletic Facilities
	(26)	Churches
	(28)	Office Buildings
	(31)	Water Treatment Plants
	(32)	Wastewater Treatment
	(34)	Water/Sewer Lines
	(39)	Military Housing
	(40)	Military Offices
	(41)	Military Training Facilities
	(42)	Military Medical Facilities
MILCON — Air Force	(01)	Hospitals
	(03)	Clinics/Outpatient Facilities
	(04)	Medical Office
	(06)	Warehouse/Distribution Centers
	(07)	Light Industrial
	(10)	Motels (Low Rise)
	(16)	Low Rise Office Buildings
	(19)	General Offices
	(24)	Dormitory/Housing
	(25)	Sports/Athletic Facilities
	(26)	Churches
	(28)	Office Buildings
	(31)	Water Treatment Plants
	(32)	Wastewater Treatment
	(34)	Water/Sewer Lines
	(38)	Airports
	(39)	Military Housing
	(41)	Military Training Facilities
	(42)	Military Medical Facilities

Note: The two-digit number in parentheses refers to the CMAA survey project category code.

Table C-5.
Mapping of Private-Sector Project Types to Corps of Engineers Fund Types (Continued)

USACE fund types	Code	Private-sector project types
Military Construction (continued)		
MILCON — Army Reserves	(16)	Low Rise Office Buildings
	(22)	Classrooms
	(49)	Federal Office Buildings
MILCON — Other	(04)	Medical Office
	(06)	Warehouse/Distribution Centers
	(07)	Light Industrial
	(08)	Process Plants/Heavy Industrial
	(11)	Apartments/Condos (High rise)
	(12)	Apartments/Condos (Low Rise)
	(13)	Single Family Housing
	(14)	High Rise Office Buildings
	(15)	Mid Rise Office Buildings
	(20)	Retail Stores
	(22)	Classrooms
	(23)	Science/Research Labs
	(24)	Dormitories/Housing
	(25)	Sports/Athletic Facilities
	(26)	Churches
	(27)	Theaters/Auditoriums
	(28)	Office Buildings
	(29)	Museums/Galleries
	(30)	Correctional Facilities
	(31)	Water Treatment Plants
	(32)	Wastewater Treatment
	(33)	Hazardous Waste Facilities
	(34)	Water/Sewer Lines
	(35)	Bridges
	(36)	Roads
	(37)	Tunnels
	(38)	Airports
	(39)	Military Housing
	(40)	Military Offices
	(41)	Military Training Facilities
	(42)	Military Medical Facilities
	(49)	Federal Office Buildings
	(50)	Postal Facilities

Note: The two-digit number in parentheses refers to the CMAA survey project category code.

Table C-5.
Mapping of Private-Sector Project Types to Corps of Engineers Fund Types (Continued)

USACE fund types	Code	Private-sector project types
Military Construction (continued)		
Operations and Maintenance — Army		All renovation projects for the following:
	(01)	Hospitals
	(03)	Clinics/Outpatient Facilities
	(04)	Medical Office
	(06)	Warehouse/Distribution Centers
	(07)	Light Industrial
	(08)	Process Plants/Heavy Industrial
	(10)	Motels (Low Rise)
	(16)	Low Rise Office Buildings
	(19)	General Offices
	(24)	Dormitory/Housing
	(25)	Sports/Athletic Facilities
	(26)	Churches
	(28)	Office Buildings
	(31)	Water Treatment Plants
	(32)	Wastewater Treatment
	(34)	Water/Sewer Lines
	(36)	Roads
	(39)	Military Housing
	(40)	Military Offices
	(41)	Military Training Facilities
	(42)	Military Medical Facilities
	(49)	Federal Office Buildings
Operations and Maintenance — Air Force	(01)	Hospitals
	(03)	Clinics/Outpatient Facilities
	(04)	Medical Office
	(06)	Warehouse/Distribution Centers
	(07)	Light Industrial
	(08)	Process Plants/Heavy Industrial
	(10)	Motels (Low Rise)
	(16)	Low Rise Office Buildings
	(19)	General Offices
	(24)	Dormitories/Housing
	(25)	Sports/Athletic Facilities
	(26)	Churches
	(28)	Office Buildings
	(31)	Water Treatment Plants
	(32)	Wastewater Treatment

Note: The two-digit number in parentheses refers to the CMAA survey project category code.

Table C-5.
Mapping of Private-Sector Project Types to Corps of Engineers Fund Types (Continued)

USACE fund types	Code	Private-sector project types
Military Construction (continued)		
Operations and Maintenance — Air Force (continued)	(33)	Hazardous Waste Facilities
	(34)	Water/Sewer Lines
	(36)	Roads
	(38)	Airports
	(39)	Military Housing
	(40)	Military Offices
	(41)	Military Training Facilities
	(42)	Military Medical Facilities
	(49)	Federal Office Buildings
Production Base Support	(06)	Warehouse/Distribution Centers
	(08)	Process Plants/Heavy Industrial
	(33)	Hazardous Waste Facilities
	(34)	Water/Sewer Lines
	(36)	Roads
	(49)	Federal Office Buildings
Defense Environmental Restoration Program	(31)	Water Treatment Plants
	(32)	Wastewater Treatment
	(33)	Hazardous Waste Facilities
	(34)	Water/Sewer Lines
Other	(04)	Medical Offices
	(14)	High Rise Office Buildings
	(20)	Retail Stores
	(26)	Churches
	(50)	Postal Facilities

Note: The two-digit number in parentheses refers to the CMAA survey project category code.

Table C-6 is a summary of the CM fees for all projects by size of company, type of company, and client base. This analysis supports the earlier statement that the CM fee is not affected by the size of the company. However, this table indicates that the pure CM companies are providing CM services at the least cost regardless of the type of construction project. Also, CM companies providing services primarily for the government are doing so at lower cost than those CM companies providing services primarily for the private sector.

Table C-6.
Summary of Construction Management Fee
(as a percentage of construction contract)

	CM fee			Number of projects	Number of companies
	25th	Median	75th		
Overall	3.5%	5.0%	7.1%	187	33[a]
Size of company (number of employees)					
1 – 5	2.4	5.0	6.6	21	4
6 – 10	4.5	5.9	10.5	29	5
11 – 15	4.6	6.0	8.1	17	5
16 – 25	4.0	4.8	5.5	24	4
26 – 50	3.6	4.9	7.5	33	6
51 – 100	4.6	5.4	9.6	12	2
101 – 250	2.6	6.8	10.3	6	1
251 – 500	4.2	5.7	9.1	16	2
Over 500	1.2	2.5	6.0	29	4
Type of company					
CM firm	3.7	5.0	7.2	108	20
GC/CM firm	4.5	5.1	8.6	30	5
A-E/CM firm	2.2	4.5	6.7	49	8
Client base					
Government	2.8	4.6	6.1	92	17
Private sector	3.6	5.0	8.3	42	9
Mixed	3.8	5.7	9.9	53	7

[a]Two companies did not provide fee information.

Table C-7 summarizes the CM services provided during each construction project, by survey participants, for all projects. In addition, the table shows the relative weight associated with each phase of CM as it relates to the total cost of the CM contract. The results indicate that the level of services provided during the CM projects has increased from that provided during a 1989 survey. Since the level of service is a major determinant of the total CM cost, the higher level of services would account for the fact that the CM fee determined by the current survey was slightly higher than that calculated from the 1989 survey.

Table C-7.
Level and Relative Cost of CM Project Services

CM services	Service results (%)		Relative phase cost (%)	
	1993	1989	1993	1989
Predesign Phase			6.5	3.6
Project management	56	46		
Scheduling	63	43		
Cost management	59	42		
Contract/project administration	56	40		
Design and Bid Phase			13.7	9.4
Project management	69	64		
Scheduling	74	64		
Cost estimating	72	42		
Constructibility review	64	29		
Quality assurance	47			
Contract/project administration	66	69		
Construction Phase			81.7	77.8
Project management	90	88		
Scheduling	89	85		
Cost management	91	86		
Quality assurance	84	70		
Contract/project administration	93	93		
Additional Services			2.9	9.3
Procurement of materials	17	27		
Value engineering	40	31		
Materials testing	14	17		
Claims analysis	14	17		
Other	2	10		

PROJECT STATISTICS SUMMARIES

Tables C-8 through C-19 provide the following information for each of the 13 construction categories listed in Table C-5:

- *Construction management (CM) fee as a percentage of construction cost.* The CM fee is presented as a percentage of the value of the construction contract. This is done to establish a basis for comparing the fees over varying types of construction and conditions. For instance, for each construction type category, the CM fee is given for the following:

  - all projects,
  - CM as owner's agent contracts,
  - CM provides guaranteed maximum price contracts,
  - renovation projects, and
  - new construction projects.

For each of these conditions, we present the 25th percentile, median, 75th percentile, and the number of individual projects analyzed. We also give the number of different companies providing the project information so that the reader can see whether the information provided is unique to a single company or whether the data are representative of several different companies. The CM fee ranges indicate what industry members are charging for services provided, and they can be used as the starting point for determining an appropriate CM fee for the various types of construction and conditions. In the tables, N/A indicates that too few data points were available to calculate the 25th and 75th percentile statistics.

- *Construction and CM contract value.* We show the average value of the construction and CM contracts used in the CM fee analysis.

- *Basis for estimating CM contract value.* We show the methods used by the participants in the survey to determine the fee: percentage of construction contract value, direct and indirect cost calculation, or other.

- *Summary of CM services.* We also show the CM services that are provided for the reported projects. The types of services are defined in the Construction Management Association of America *Standard CM Services and Practice* manual. This list is intended to show the likelihood of the various types of services for each of the construction categories and in no way attempts to define a cost associated with each service provided. However, when analyzing the CM fee data in the first part of each table, the reader should recognize that the fees may be affected by the services provided. Relative weights for each phase that can help determine the relative costs for a particular service are provided in Tables C-8 through C-19.

Table C-8.
Family Housing – Army

Construction Management Fee as a Percentage of Construction Cost

	CMF (%)			Number of projects	Number of companies
	25th	Median	75th		
Overall fee	2.9	5.3	8.0	15	9
CM as owner's agent	2.8	4.9	6.9	12	7
CM provides guaranteed maximum price	N/A	5.7	N/A	2	1
Renovation	1.4	5.5	13.3	6	4
New construction	3.3	5.3	7.0	9	6

Average value of construction contract	$8,417,400
Average value of CM contract	$226,277
Basis for estimating CM contract value	
Percentage of construction contract value	7%
Direct and indirect cost calculation	93%
Other	0%

Services provided	Service frequency (%)	Relative phase cost (%)
Predesign Phase		13.8
Project management	87	
Scheduling	87	
Cost management	80	
Contract/project administration	80	
Design and Bid Phase		16.3
Project management	73	
Scheduling	80	
Cost estimating	73	
Constructibility review	53	
Quality assurance	73	
Contract/project administration	73	
Construction Phase		64.9
Project management	100	
Scheduling	100	
Cost management	100	
Quality assurance	100	
Contract/project administration	87	
Additional Services		5.0
Procurement of materials	20	
Value engineering	53	
Materials testing	13	
Claims analysis	13	
Other	0	

Table C-9.
Family Housing — Air Force

Construction Management Fee as Percentage of Construction Cost

	CMF(%)			Number of projects	Number of companies
	25th	Median	75th		
Overall fee	2.9	5.3	8.0	15	9
CM as owner's agent	2.8	4.9	6.9	12	7
CM provides guaranteed maximum price	N/A	5.7	N/A	2	1
Renovation	1.4	5.5	13.3	6	4
New construction	3.3	5.3	7.0	9	6

Average value of construction contract	$8,417,400
Average value of CM contract	$226,277
Basis for estimating CM contract value	
Percent of construction contract value	7%
Direct and indirect cost calculation	93%
Other	0%

Services provided	Service frequency (%)	Relative phase cost (%)
Predesign Phase		13.8
Project management	87	
Scheduling	87	
Cost management	80	
Contract/project administration	80	
Design and Bid Phase		16.3
Project management	73	
Scheduling	80	
Cost estimating	73	
Constructibility review	53	
Quality assurance	73	
Contract/project administration	73	
Construction Phase		64.9
Project management	100	
Scheduling	100	
Cost management	100	
Quality assurance	100	
Contract/project administration	87	
Additional Services		5.0
Procurement of materials	20	
Value engineering	53	
Materials testing	13	
Claims analysis	13	
Other		

Table C-10.
Foreign Military Sales

Construction Management Fee as a Percentage of Construction Cost

	CMF (%)			Number of projects	Number of companies
	25th	Median	75th		
Overall fee	6.1	6.9	20.0	12	8
CM as owner's agent	5.7	6.6	36.4	11	8
CM provides guaranteed maximum price	N/A	25.2	N/A	1	1
Renovation	N/A	9.3	N/A	3	3
New construction	5.2	6.5	82.1	9	5

Average value of construction contract	$20,403,667
Average value of CM contract	$858,658
Basis for estimating CM contract value	25%
Percentage of construction contract value	75%
Direct and indirect cost calculation	0%
Other	

Services provided	Service frequency (%)	Relative phase cost (%)
Predesign Phase		2.3
Project management	17	
Scheduling	42	
Cost management	42	
Contract/project administration	17	
Design and Bid Phase		9.8
Project management	67	
Scheduling	67	
Cost estimating	67	
Constructibility review	75	
Quality assurance	17	
Contract/project administration	33	
Construction Phase		87.2
Project management	75	
Scheduling	83	
Cost management	83	
Quality assurance	83	
Contract/project administration	75	
Additional Services		0.8
Procurement of materials	0	
Value engineering	17	
Materials testing	8	
Claims analysis	0	
Other	0	

Table C-11.
Host Nation

Construction Management Fee as a Percentage of Construction Cost

	CMF (%)			Number of projects	Number of companies
	25th	Median	75th		
Overall fee	4.9	7.4	11.3	37	19
CM as owner's agent	4.9	7.0	12.2	30	15
CM provides guaranteed maximum price	4.6	5.9	13.4	7	6
Renovation	4.9	5.8	13.4	18	13
New construction	4.9	6.0	15.3	17	7

Average value of construction contract	$60,405,459
Average value of CM contract	$2,146,322
Basis for estimating CM contract value	
Percentage of construction contract value	22%
Direct and indirect cost calculation	78%
Other	0%

Services provided	Service frequency (%)	Relative phase cost (%)
Predesign Phase		3.5
Project management	35	
Scheduling	59	
Cost management	43	
Contract/project administration	51	
Design and Bid Phase		10.2
Project management	65	
Scheduling	70	
Cost estimating	62	
Constructibility review	68	
Quality assurance	27	
Contract/project administration	46	
Construction Phase		82.7
Project management	86	
Scheduling	73	
Cost management	81	
Quality assurance	92	
Contract/project administration	81	
Additional Services		3.0
Procurement of materials	19	
Value engineering	32	
Materials testing	14	
Claims analysis	24	
Other	5	

Table C-12.
Military Construction — Army

Construction Management Fee as a Percentage of Construction Cost

	CMF (%)			Number of projects	Number of companies
	25th	Median	75th		
Overall fee	4.9	6.6	12.2	54	23
CM as owner's agent	4.9	6.6	12.7	39	19
CM provides guaranteed maximum price	4.8	6.3	9.9	15	7
Renovation	5.7	6.6	12.4	17	11
New construction	4.8	6.3	11.8	37	19

Average value of construction contract	$13,533,593
Average value of CM contract	$633,766

Basis for estimating CM contract value

Percentage of construction contract value	25%
Direct and indirect cost calculation	75%
Other	0%

Services provided	Service frequency (%)	Relative phase cost (%)
Predesign Phase		5.7
Project management	57	
Scheduling	63	
Cost management	63	
Contract/project administration	56	
Design and Bid Phase		12.7
Project management	72	
Scheduling	78	
Cost estimating	78	
Constructibility review	65	
Quality assurance	52	
Contract/project administration	61	
Construction Phase		77.2
Project management	91	
Scheduling	93	
Cost management	91	
Quality assurance	89	
Contract/project administration	85	
Additional Services		3.9
Procurement of materials	30	
Value engineering	39	
Materials testing	15	
Claims analysis	13	
Other	2	

Table C-13.
Military Construction — Air Force

Construction Management Fee as a Percentage of Construction Cost

	CMF (%)			Number of projects	Number of companies
	25th	Median	75th		
Overall fee	4.9	6.6	12.2	54	23
CM as owner's agent	4.9	6.6	12.7	39	19
CM provides guaranteed maximum price	4.8	6.3	9.9	15	7
Renovation	5.7	6.6	12.4	17	11
New construction	4.8	6.3	11.8	37	19

Average value of construction contract	$13,533,593
Average value of CM contract	$633,766
Basis for estimating CM contract value	
Percentage of construction contract value	25%
Direct and indirect cost calculation	75%
Other	0%

Services provided	Service frequency (%)	Relative phase cost (%)
Predesign Phase		5.7
Project management	57	
Scheduling	63	
Cost management	63	
Contract/project administration	56	
Design and Bid Phase		12.7
Project management	72	
Scheduling	78	
Cost estimating	78	
Constructibility review	65	
Quality assurance	52	
Contract/project administration	61	
Construction Phase		77.2
Project management	91	
Scheduling	93	
Cost management	91	
Quality assurance	89	
Contract/project administration	85	
Additional Services		3.9
Procurement of materials	30	
Value engineering	39	
Materials testing	15	
Claims analysis	13	
Other	2	

Table C-14.
Military Construction — Army Reserves

Construction Management Fee as a Percentage of Construction Cost

	CMF (%)			Number of projects	Number of companies
	25th	Median	75th		
Overall fee	5.0	6.9	11.2	50	15
CM as owner's agent	4.9	6.0	8.5	43	14
CM provides guaranteed maximum price	19.7	23.6	27.9	7	2
Renovation	5.8	8.4	20.3	21	9
New construction	4.9	5.9	10.4	29	12

Average value of construction contract	$25,355,740
Average value of CM contract	$853,663
Basis for estimating CM contract value	
Percentage of construction contract value	20%
Direct and indirect cost calculation	80%
Other	0%

Services provided	Service frequency (%)	Relative phase cost (%)
Predesign Phase		6.3
Project management	52	
Scheduling	68	
Cost management	56	
Contract/project administration	56	
Design and Bid Phase		13.2
Project management	70	
Scheduling	78	
Cost estimating	78	
Constructibility review	72	
Quality assurance	36	
Contract/project administration	62	
Construction Phase		97.9
Project management	86	
Scheduling	80	
Cost management	90	
Quality assurance	92	
Contract/project administration	74	
Additional Services		0.8
Procurement of materials	2	
Value engineering	32	
Materials testing	12	
Claims analysis	4	
Other	0	

Table C-15.
Military Construction — Other

Construction Management Fee as a Percentage of Construction Cost

	CMF (%)			Number of projects	Number of companies
	25th	Median	75th		
Overall fee	4.9	6.6	10.9	150	29
CM as owner's agent	4.8	6.5	9.8	130	25
CM provides guaranteed maximum price	6.1	10.0	22.8	20	6
Renovation	4.8	7.8	11.7	57	20
New construction	4.9	6.3	9.7	92	27

Average value of construction contract	$31,824,260
Average value of CM contract	$1,234,533
Basis for estimating CM contract value	
Percentage of construction contract value	19%
Direct and indirect cost calculation	82%
Other	1%

Services provided	Service frequency (%)	Relative phase cost (%)
Predesign Phase		6.6
Project management	55	
Scheduling	63	
Cost management	57	
Contract/project administration	54	
Design and Bid Phase		14.3
Project management	69	
Scheduling	73	
Cost estimating	72	
Constructibility review	63	
Quality assurance	44	
Contract/project administration	63	
Construction Phase		82.5
Project management	89	
Scheduling	87	
Cost management	89	
Quality assurance	92	
Contract/project administration	83	
Additional Services		2.4
Procurement of materials	13	
Value engineering	39	
Materials testing	15	
Claims analysis	15	
Other	1	

Table C-16.
Operations and Maintenance – Army

Construction Management Fee as a Percentage of Construction Cost

	CMF (%)			Number of projects	Number of companies
	25th	Median	75th		
Overall fee	4.9	7.1	11.9	79	26
CM as owner's agent	4.9	7.1	12.4	63	22
CM provides guaranteed maximum price	5.2	6.6	9.6	16	7
Renovation	5.4	7.1	11.9	31	12
New construction	4.9	7.0	11.4	48	22

Average value of construction contract	$46,247,481
Average value of CM contract	$1,725,878
Basis for estimating CM contract value	
Percentage of construction contract value	19%
Direct and indirect cost calculation	81%
Other	0%

Services provided	Service frequency (%)	Relative phase cost (%)
Predesign Phase		5.1
Project management	51	
Scheduling	62	
Cost management	54	
Contract/project administration	57	
Design and Bid Phase		12.1
Project management	53	
Scheduling	56	
Cost estimating	54	
Constructibility review	52	
Quality assurance	33	
Contract/project administration	46	
Construction Phase		79.2
Project management	90	
Scheduling	86	
Cost management	89	
Quality assurance	91	
Contract/project administration	86	
Additional Services		3.4
Procurement of materials	25	
Value engineering	32	
Materials testing	14	
Claims analysis	18	
Other	4	

Table C-17.
Operations and Maintenance – Air Force

Construction Management Fee as a Percentage of Construction Cost

	CMF (%)			Number of projects	Number of companies
	25th	Median	75th		
Overall fee	5.0	7.1	11.7	85	26
CM as owner's agent	5.0	6.6	12.4	69	22
CM provides guaranteed maximum price	5.2	6.6	9.6	16	7
Renovation	5.7	7.1	11.7	32	12
New construction	4.9	6.9	11.8	53	23

Average value of construction contract	$43,253,294
Average value of CM contract	$1,626,851
Basis for estimating CM contract value	
Percentage of construction contract value	18%
Direct and indirect cost calculation	82%
Other	0%

Services provided	Service frequency (%)	Relative phase cost (%)
Predesign Phase		4.7
Project management	47	
Scheduling	58	
Cost management	51	
Contract/project administration	53	
Design and Bid Phase		11.3
Project management	64	
Scheduling	66	
Cost estimating	64	
Constructibility review	64	
Quality assurance	39	
Contract/project administration	54	
Construction Phase		80.6
Project management	91	
Scheduling	86	
Cost management	88	
Quality assurance	92	
Contract/project administration	87	
Additional Services		3.2
Procurement of materials	24	
Value engineering	29	
Materials testing	13	
Claims analysis	16	
Other	4	

Table C-18.
Production Base Support

Construction Management Fee as a Percentage of Construction Cost

	CMF (%)			Number of projects	Number of companies
	25th	Median	75th		
Overall fee	5.1	7.7	13.0	35	12
CM as owner's agent	5.4	7.8	13.2	32	10
CM provides *guaranteed maximum price*	N/A	7.2	N/A	3	2
Renovation	5.1	7.9	11.7	17	5
New construction	5.0	7.4	14.5	18	7

Average value of construction contract	$86,305,314
Average value of CM contract	$3,136,517
Basis for estimating CM contract value	
Percentage of construction contract value	9%
Direct and indirect cost calculation	91%
Other	0%

Services provided	Service frequency (%)	Relative phase cost (%)
Predesign Phase		3.8
Project management	37	
Scheduling	54	
Cost management	37	
Contract/project administration	54	
Design and Bid Phase		10.4
Project management	51	
Scheduling	51	
Cost estimating	51	
Constructibility review	63	
Quality assurance	26	
Contract/project administration	51	
Construction Phase		83.9
Project management	89	
Scheduling	77	
Cost management	86	
Quality assurance	94	
Contract/project administration	89	
Additional Services		2.1
Procurement of materials	20	
Value engineering	23	
Materials testing	14	
Claims analysis	26	
Other	6	

Table C-19.
Defense Environmental Restoration Program

Construction Management Fee as a Percentage of Construction Cost

	CMF (%)			Number of projects	Number of companies
	25th	Median	75th		
Overall fee	6.5	12.1	16.8	11	6
CM as owner's agent	6.5	12.1	16.8	11	6
CM provides guaranteed maximum price	N/A	N/A	N/A	0	0
Renovation	N/A	10.7	N/A	4	3
New construction	6.2	13.1	13.2	7	5

Average value of construction contract	$21,634,455
Average value of CM contract	$1,488,364
Basis for estimating CM contract value	
Percentage of construction contract value	0%
Direct and indirect cost calculation	100%
Other	0%

Services provided	Service frequency (%)	Relative phase cost (%)
Predesign Phase		1.2
Project management	18	
Scheduling	18	
Cost management	9	
Contract/project administration	18	
Design and Bid Phase		7.8
Project management	18	
Scheduling	27	
Cost estimating	45	
Constructibility review	36	
Quality assurance	27	
Contract/project administration	27	
Construction Phase		90.0
Project management	100	
Scheduling	82	
Cost management	82	
Quality assurance	100	
Contract/project administration	91	
Additional Services		1.3
Procurement of materials	9	
Value engineering	18	
Materials testing	27	
Claims analysis	18	
Other	0	

APPENDIX D

Sample Questionnaire for Construction Management Cost Survey

Sample Questionnaire for Construction Management Cost Survey

SURVEY INSTRUCTIONS

1. – 5. Self-explanatory

6. Indicate the types of fees, as a percentage, your company charges for the types listed. Must add to 100%.

   A. **Negotiated Fixed Fee** — predetermined negotiated amount based on services and qualifications.
   B. **Lump Sum Bid** — predetermined amount (fixed fee) for the CM work.
   C. **Cost plus Fixed Fee** — owner pays for all costs and overhead incurred on the project plus a fixed fee (profit).
   D. **Time Spent** — fee is based on an established hourly rate. Owner is billed for (hours) x (rate).
   E. **Percentage of Construction Contract** — fee is determined as a percentage of the actual construction contract amount. Fee = % x Construction ($).

7. Here we would like to determine your company's areas of expertise. Indicate, as a percentage of all CM projects, the areas of construction that your company provides CM services for. Indicate 0% where appropriate. Must add to 100%.

All information for items 8. – 13. should be obtained from your most recent financial year records. Please indicate these numbers as a percentage of total construction management revenues where indicated.

8. **Direct Labor** — All unburdened labor charged to projects including the portions charged by principals and nontechnical employees.

9. **Payroll Burden** — All fringe expenses paid by the company for mandatory payroll taxes, vacation leave, sick leave, holiday leave, personnel leave, group insurance, pension plans, etc., for both direct and indirect labor.

10. **G&A Labor** — All nonproject labor expenses for the technical staff, principals, and administrative staff.

11. **G&A Expenses** — All indirect expenses for rents, utilities, maintenance, depreciation, interest, basic service telephone, insurance, loan interest, uncollectible debt, training and education expenses, legal and account expenses, general supplies (nonproject), and administrative labor.

12. **Non-labor Direct** — All project-related expenses including travel, printing, telephone, outside consulting fees, and project-related supplies.

13. **Annual Operating Income** — All operating income from construction management services as a percentage of total CM revenues.

SURVEY INSTRUCTIONS

14. The following table provides code numbers representing construction types (grouped by most common owner). Select the code best depicting the type of construction you are providing CM project data for. Insert the code in line 14 of the survey form. Please limit your responses to construction types that you have had experience with.

Health Care Providers
- 01 Hospitals
- 03 Clinics/Outpatient Facilities
- 04 Medical Offices
- 05 Extended Care/Nursing Homes

Corporate/Industrial
- 06 Warehouse/Distribution Centers
- 07 Light Industrial
- 08 Process Plants/Heavy Industrial

Housing/Lodging
- 09 Hotels (High Rise)
- 10 Motels (Low Rise)
- 11 Apartments/Condos (High Rise)
- 12 Apartments/Condos (Low Rise)
- 13 Single Family Housing

Commercial Developers
- 14 High Rise Office Buildings
- 15 Mid Rise Office Buildings
- 16 Low Rise Office Buildings
- 17 Shopping Malls (Enclosed)
- 18 Strip Shopping Centers

Corporate/Administrative/Commercial
- 19 General Offices
- 20 Retail Stores
- 21 Restaurants

Educational/Institutional
- 22 Classrooms
- 23 Science/Research Labs
- 24 Dormitories/Housing
- 25 Sports/Athletic Facilities

Private Religious/Cultural
- 26 Churches
- 27 Theaters/Auditoriums

State and Local Govt.
- 28 Office Buildings
- 29 Museums/Galleries
- 30 Correctional Facilities

Environmental Protection Agency
- 31 Water Treatment Plants
- 32 Wastewater Treatment
- 33 Hazardous Waste Facilities
- 34 Water/Sewer Lines

Transportation Departments
- 35 Bridges
- 36 Roads
- 37 Tunnels
- 38 Airports

Department of Defense
- 39 Military Housing
- 40 Military Offices
- 41 Military Training Facilities
- 42 Military Medical Facilities
- 43 Piers/Wharfs
- 44 Dredging
- 45 Locks and Dams
- 46 Reservoirs
- 47 Channel Protection
- 48 Beach Stabilization

Other Federal
- 49 Office Buildings
- 50 Postal Facilities

15. – 18. Self-explanatory

19. On lines I, II, III, and IV, estimate the percentage of the total CM contract value (line 20), represented by that "service phase." Lines I – IV should add to 100%. For the individual CM project services, make sure you are selecting those that were actually provided.

20. – 21. Self-explanatory.

CONSTRUCTION MANAGEMENT ASSOCIATION OF AMERICA
SURVEY OF CONSTRUCTION MANAGEMENT COSTS

1. Size of company (total staff + full-time equivalent of part-time staff)

A.	1 – 5	F.	51 – 100
B.	6 – 10	G.	101 – 150
C.	11 – 15	H.	151 – 250
D.	16 – 25	I.	251 – 500
E.	26 – 50	J.	Over 500

2. Type of company
   - A. Construction management (CM) firm
   - B. General contractor/CM firm
   - C. Architectural and engineering/CM firm
   - D. Other_____

3. Total annual revenues from construction management projects including subcontract costs. (For most recent fiscal year.)
   fee only _____%
   at risk _____%

4. Average number of CM projects completed by your company per year for last 3 years.

5. Client base (must add to 100 percent)
   - A. Government clients _____%
   - B. Private-sector clients _____%

6. Indicate, as a percentage of all CM projects, the types of fees your company charges the customer (must add to 100% — see "instructions")
   - A. Negotiatied fixed fee _____%
   - B. Lump sum bid _____%
   - C. Cost plus fixed fee _____%
   - D. Time spent (with max. or T&M) _____%
   - E. Percentage of construction contract _____%
   - F. Other_____ _____%

7. Indicate as a percentage of all CM projects, the types of customers your company provides services for (must add to 100% — see "instructions")
   - A. Health Care Providers _____%
   - B. Corporate/Industrial _____%
   - C. Housing/Lodging _____%
   - D. Commercial Developers _____%
   - E. Corporate/Administrative/Commercial _____%
   - F. Educational/Institutional _____%
   - G. Private Religious/Cultural _____%
   - H. State and Local Government _____%
   - I. Environmental Protection Agency _____%
   - J. Transportation Departments _____%
   - K. Department of Defense _____%

Note: See "instructions" for definitions of expenses and costs.

8.	CM direct labor costs (as a percentage of total CM revenues)	_____%
9.	Payroll burden or fringes (as a percentage of total CM revenues)	_____%
10.	CM G&A labor (as a percentage of total CM revenues)	_____%
11.	CM G&A expenses (as a percentage of total CM revenues)	_____%
12.	CM nonlabor direct expenses (as a percentage of total CM revenues)	_____%
13.	Annual operating income from CM (as a percentage of total CM revenue)	_____%

(Continue on next page)

CONSTRUCTION MANAGEMENT PROJECT DATA

Note: Provide data for individual CM projects your company is currently managing or has completed within the last 3 years. Complete survey for at least 6 projects. However, we are requesting that you complete an additional 6 so the results of the survey will yield better statistics. Indicate "yes" answers by marking the appropriate space with an "x." "No" answers should be left blank.

	Example	Project #1	Project #2	Project #3	Project #4	Project #5	Project #6
14. Type of construction project (select code from list on special instructions page)	30						
15. City & state where construction project occurred	Beth., Md.						
16. Value of construction project	$1,000,000						
17. Scope of construction project (mark only one)							
A. Renovation							
B. New construction	x						
18. Type of contract (mark only one)							
A. CM as agent	x						
B. CM provides guaranteed maximum price							
19. CM services provided for the customer (mark as many services as would apply to CM project)							
I. Predesign Phase (% cost of total contract)	2%	%	%	%	%	%	%
A. Project Management	x						
B. Scheduling	x						
C. Cost Management	x						
D. Contract/Project Administration	x						
II. Design & Bid Phase (% cost of total contract)	5%	%	%	%	%	%	%
A. Project Management	x						
B. Scheduling	x						
C. Cost Estimating	x						
D. Constructability Review							
E. Quality Assurance							
F. Contract/Project Administration	x						
III. Construction Phase (% cost of total contract)	80%	%	%	%	%	%	%
A. Project Management	x						
B. Scheduling	x						
C. Cost Management	x						
D. Contract/Project Administration	x						
E. Quality Assurance	x						
IV. Additional (% cost of total contract)	15%	%	%	%	%	%	%
A. Procurement of Materials	x						
B. Value Engineering							
C. Materials Testing	x						
D. Claims Analysis							
E. Other_____							
20. Basis for estimating CM contract value (mark only one)							
A. Percent of construction contract value							
B. Direct and indirect cost calculation	x						
C. Other _____							
21. Value of CM contract ($)	$50,000						

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Jordan W. Cassell, Jeffrey A. Hawkins

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Logistics Management Institute
6400 Goldsboro Road
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13. ABSTRACT *(Maximum 200 words)*

The U.S. Army Corps of Engineers (USACE) is the largest public engineering, design, and construction management agency in the world. Its Federal customers include the Offices of the Secretary of Defense, the Military Departments, and Federal agencies. The construction management services that USACE provides are paid for through fees assessed against the placement value of the construction.

Some USACE customers have voiced concerns that they are charged more for construction management services than they should be. We found such concerns to be unwarranted. Most USACE customers are unaware of the services that they receive and they do not realize what private-sector construction management firms charge for equivalent services.

We find that USACE is a full-service construction management organization and that the fees they charge are appropriate for the services rendered when compared with private sector fees.

14. SUBJECT TERMS

Military construction, construction management costs, construction management services, U.S. Army Corps of Engineers

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